廣華醫院
Kwong Wah Hospital

Evaluation of a Privacy-Preserving Thermographic Artificial Intelligence System for Fall Prevention:

A Prospective Clinical Implementation Study

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KWONG WAH HOSPITAL • 2026

I have no relevant financial relationships to disclose

True Cost of Patient Falls

>2,000

Patient falls annually

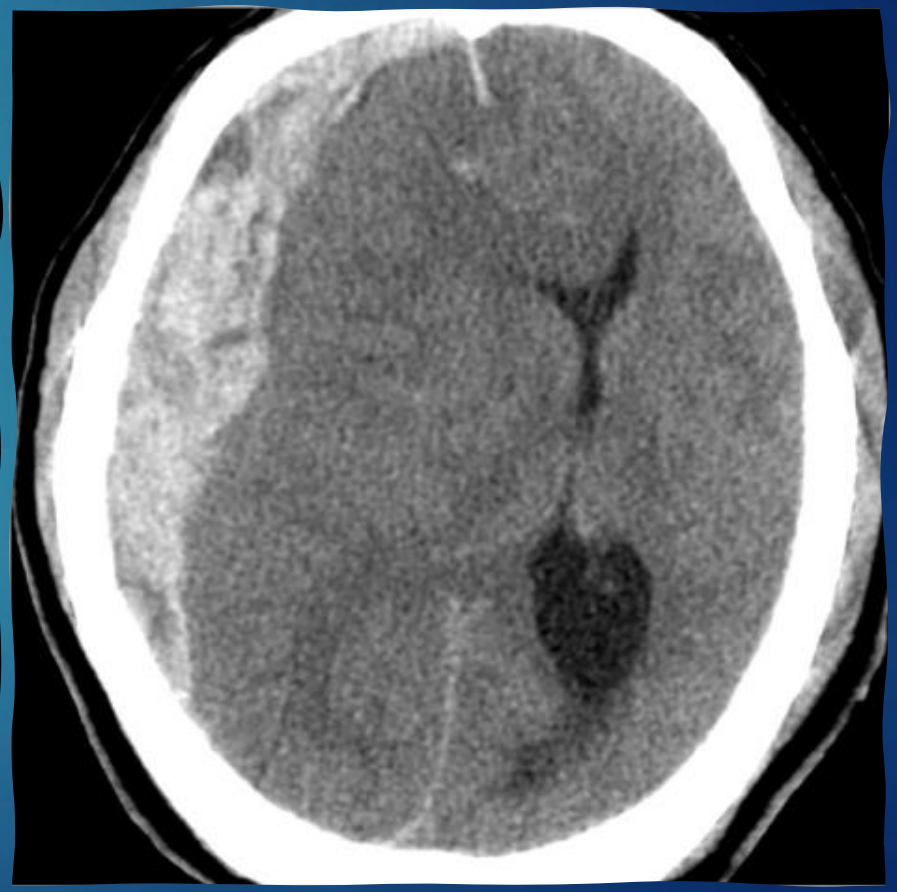
7 days

additional hospital days of each fall-related injury

10-20%

of patients who fall sustain major (SI 3) or above injury

Fall related injuries



Risk factors of inpatient Fall

Extrinsic

- Slippery surfaces
- Bad lighting
- Inappropriate footwear

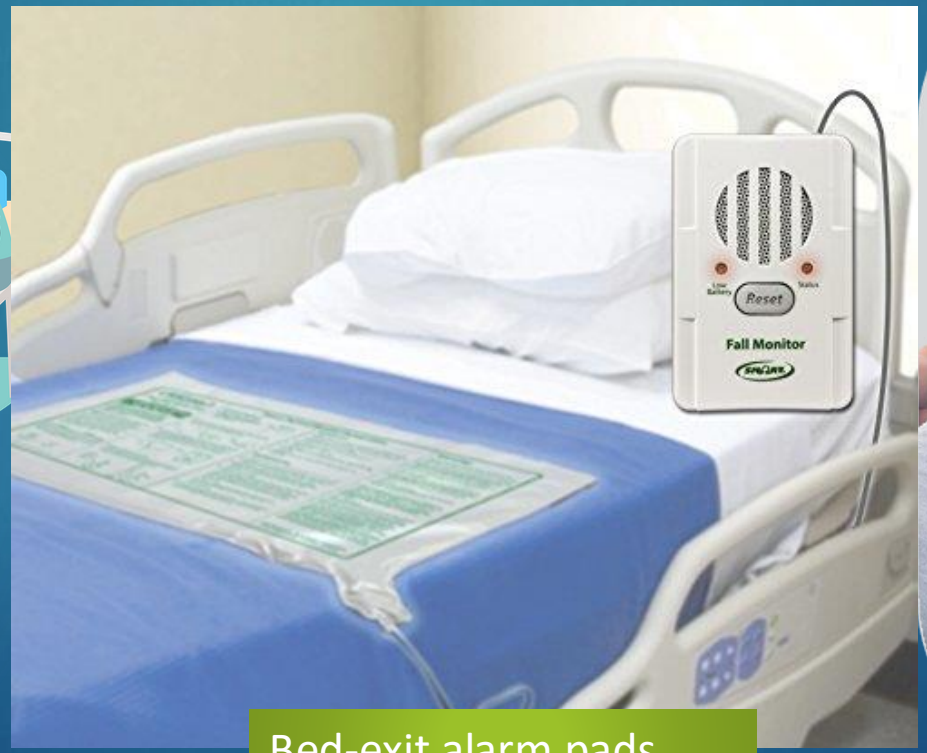
Intrinsic

- Age
- Co-morbidities
- Impaired mobility
- Influence

Unassisted bed-exit

Current measures

24/7 supervision



Bed-exit alarm pads

Physical / chemical restrain

Any smarter way?

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AI Thermographic camera monitor

PreSAGE
Better Prediction Better Care

How it works

Potential bed exit detected by AI

Alarm triggered

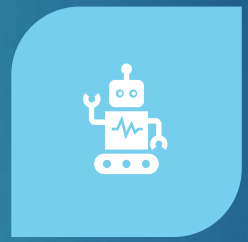
Staff attends the patient immediately, alarm off

Advantages

AI TO PREDICT BED-EXIT

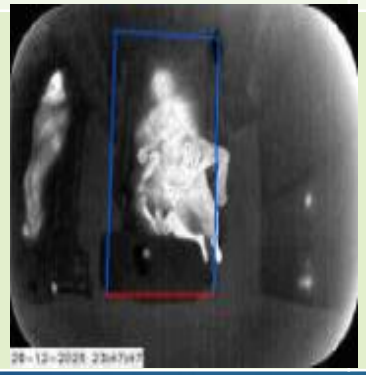
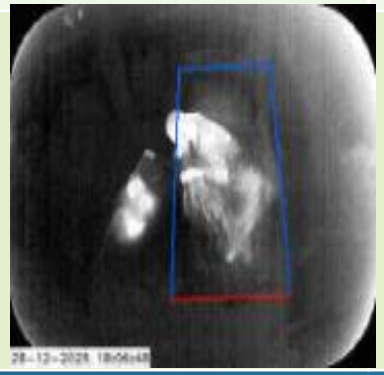
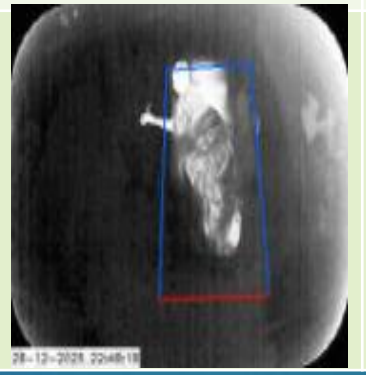
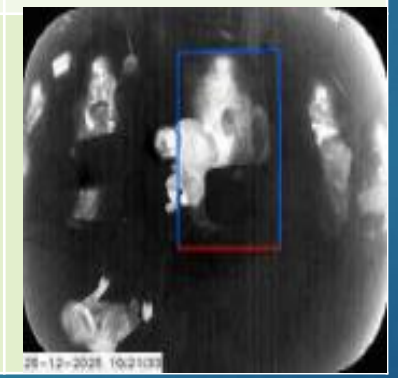
PRIVACY

CONTINUOUS MONITORING



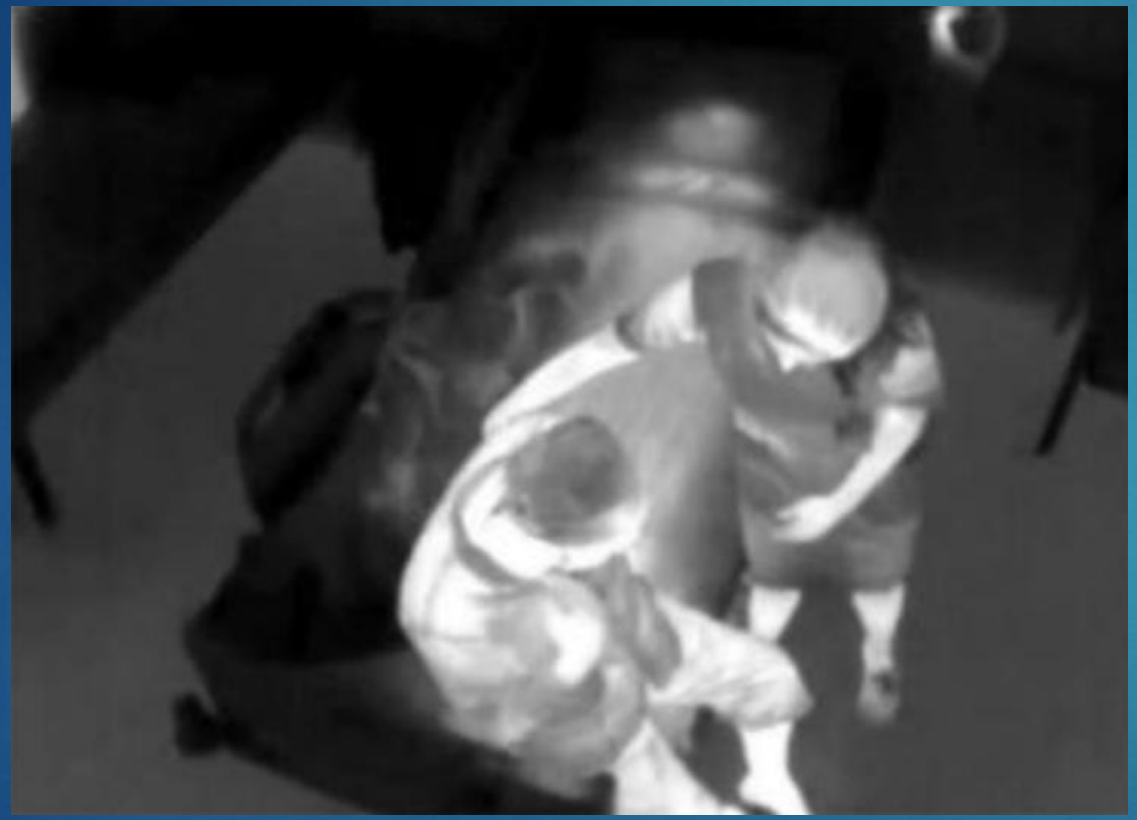
AUTOMATION

EASY INSTALLATION

Alert situation			
Bed-exit	Dangerous Motion/Posture (about to exit bed)		
Unassisted bed-exit	Reaching out dangerously with risk of rolling over	Limbs extended over rail with risk of rolling over	Patient sitting at the edge of the bed with significant motion
			

AI TO PREDICT BED-EXIT

- No patient-identifiable information



PRIVACY

- Thermography camera
- 24/7 operation

Afternoon

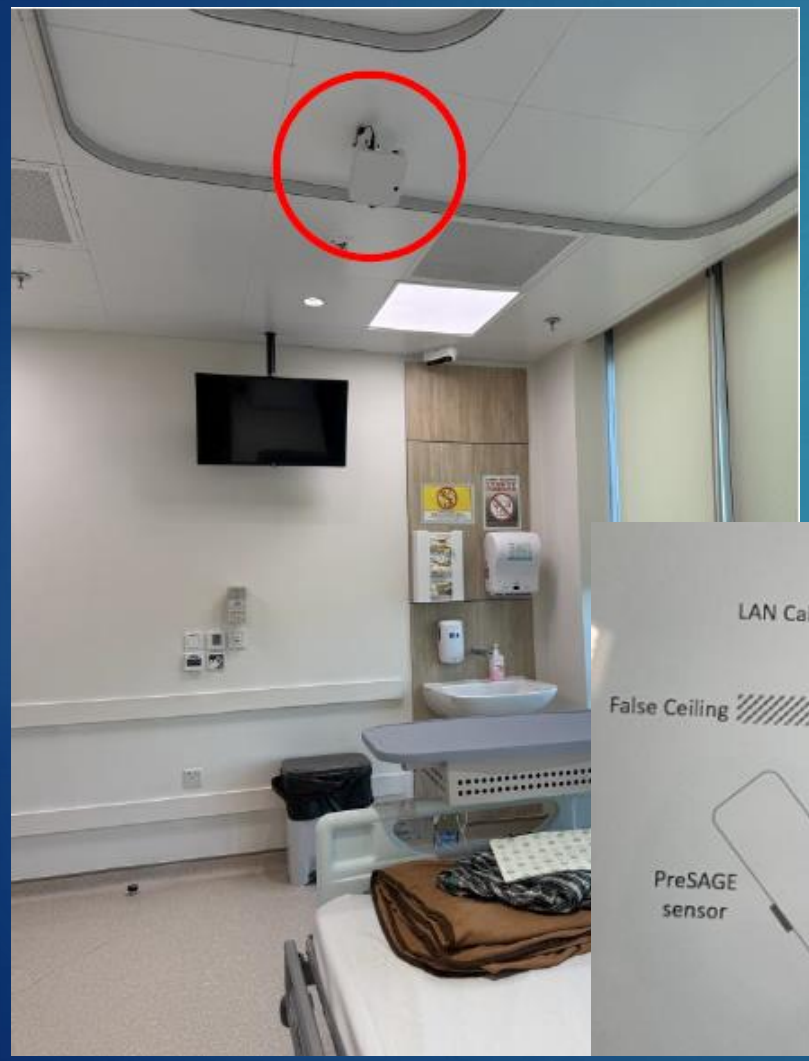
Midnight

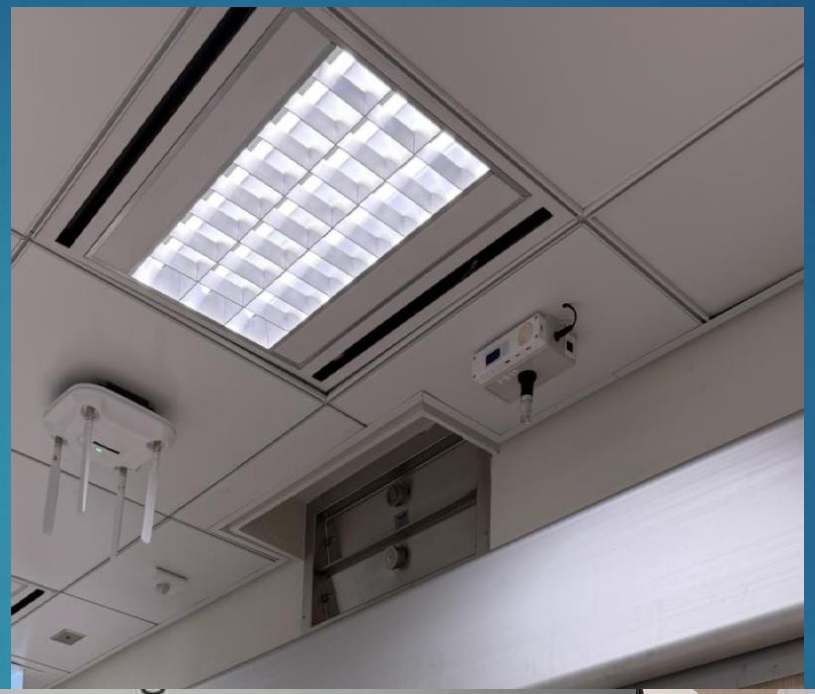
CONTINUOUS MONITORING

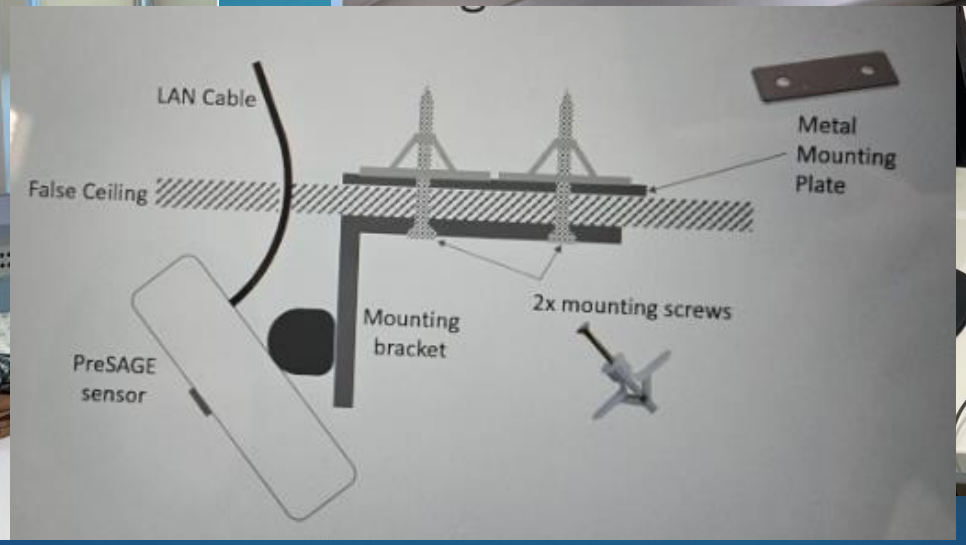
- Hands-free

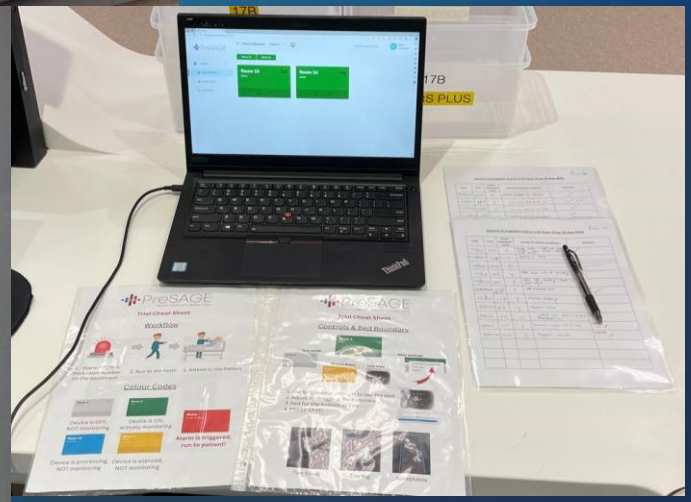
AUTOMATION

- LAN or WIFI









EASY
INSTALLATION

Study Design

- Prospective observational cohort study from Oct 2025
- 7 wards at Kwong Wah Hospital
- 18 devices above individual beds
- Patients with identified fall risks

Dept	Ward	No. of camera
M&G	17B	6
	16A	2
	5A	2
	15A	2
SUR	13B	2
ORT	14A	2
NS	14B	2
		18

Study Objectives

- **Primary Objective**
  - Sensitivity for bed-exit event detection
- **Secondary Objectives**
  - False alarm rate
  - Nursing staff acceptance & satisfaction (5-point Likert-scale)

Results

18 devices	1,145 hours
Total	116 alarms

Interpretations	Alarm Count
Alert situation & alarm triggered	88
Non-alert situation but alarm triggered	28
Alert situation but alarm did not trigger	0

Sensitivity	False alarm rate
100%	24.1%

Case illustration

Staff's response

Respondents	Response rate
102 nurses	90.2%

Domain	Survey Item	Mean (out of 5)	Interpretation
Usability	System easy to use and operate	4.01	High
	Interface user-friendly	3.96	High
	Minimal training required	3.01	Moderate –high
Workflow Integration	System disrupted workflow (reverse-scored)	1.99	Minimal disruption
	Alerts added workload (reverse-scored)	2.04	Minimal burden
Implementation Support	Support hospital-wide implementation	3.89	High
Overall Satisfaction	Global satisfaction rating	3.96	High

Clinical Significance

- High sensitivity (100%) with manageable false alarms (24.1%)
- Privacy-preserving approach addresses ethical concerns
- Minimal workflow disruption
- Strong staff support

Limitations

- Device to patient 1:1
- 2nd person at bedside affecting monitoring

Way forward

- Longer prospective studies measuring impact on fall incidence
- Cost-effectiveness analysis

Thank you